Physics motivation.

The key feature of this proposal is to trace the characteristics of the pp interaction as function of particle multiplicity. The similar task has been pursued in exp. E735 at FNAL. Specifically we intend to study:

- Two particle HBT and multiparticle correlations to measure system space – time dimensions.
- Mean transverse momentum, <p_t(n)>, where n is the multiplicity. Non monotonous behavior of <p_t(n)> was observed in E735.
- Deviation of partial cross section on commonly accepted exponential behavior. Such deviation may be the result of multiparticle interference.
- The ratio <p_t >/<p_l>, where p_l is the longitudinal momentum as the dynamical characteristic of transition to the thermalized state.
- Multiparticle energy correlators as the signal of thermalization.
- Soft photons with the energies E<30 MeV, associated with VHM. The anomalous soft photon were observed in number of experiments and tentatively interpreted as the indication on onset of (mysterious) cold spots in hot hadronic or partonic system. These photons may by detected as e^+e^- pairs in TPC constructions and in gas.

For more details see http://sunse.jinr.ru/~nikitin/ file thermalization_en.zip.

Trigger condition.

We propose to set CTB threshold to be 16 mip. According to our estimation the counting rate will be 80 at luminosity 10^30 cm^-2 c^-1. We assume CTB and TPC accept 30% of total multiplicity. As result we hope to detect 4 x 10^3 events per day at Z=4.5 and n= 90, here Z is KNO variable Z=n/<n>. <n>=20 for charged particles at E_cms =200 GeV. If actual rate will be higher, then CTB setting must be raised (and vice verse).

See Table.

n	n_tpc	Z	Sigma, mb	f	N, c^-1
20	6	1	7	0	0
50	16	2.5	1×10^{-1}	0.5	50
60	20	3	4×10^{-2}	0.7	30
70	24	3.5	2×10^{-3}	0.9	2
80	26	4	4×10^{-4}	1	0.4
90	30	4.5	4×10^{-5}	1	0.04

Notations.

n – charged particles multiplicity.

n_tpc – multiplicity detected in CTB and TPC.

Z = n/<n>.

Sigma – partial cross section. In the domain Z>3 exponential extrapolation is used.

f – trigger efficiency.

N – counting rate.